

EVALUATION OF INSECT AND DISEASE  
CONDITIONS IN THE PINES ON SENATOR STENNIS' HOMESITE

by

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*Abstract*

*The shortleaf and loblolly pine trees immediately adjacent to the back yard of Senator Stennis' homesite in DeKalb, Mississippi, are from 75 to 85 years old. They are growing slowly and have small crowns, however, no insect problems were observed. Five of the trees had disease cankers or butt rot. A carefully planned and executed scheduled surveillance of the homesite would best satisfy the management requirements of Senator Stennis.*

INTRODUCTION

In response to a request from the Mississippi Forestry Commission, an evaluation was made of the wooded areas adjacent to the home of Senator Stennis. Pine bark beetles and annosus root rot are potential problems on this site.

The southern pine beetle, Dendroctonus frontalis (Zimm.), attacks all southern pines. It is the most destructive pine bark beetle in the South. Trees may be killed singly, in small groups, or in large numbers. Infested trees are commonly located in poorly managed or overstocked stands. Sometimes southern pine beetles and other pine bark beetles move from the forest into suburban or urban areas. For this reason, owners of ornamental pines in the South should learn how to recognize and cope with bark beetle attacks.

Annosus root rot, caused by the fungus Heterobasidion annosum (Fr.) Bref., affects all southern yellow pines; it most seriously affects slash and loblolly pines with longleaf and shortleaf pines being affected to a lesser degree; trees with this disease decline and eventually die due to the loss of an effective root system.

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## OBSERVATIONS

Eighty-four loblolly and 36 shortleaf pine trees were counted on the 2 acres immediately adjacent to Senator Stennis' backyard. These trees were from 75 to 85 years old with a basal area (BA) of 110 square feet per acre. They were mature, slow-growing trees with small crowns. Old disease cankers were observed on three trees and three trees had one half or more of the butt rotted away. No other disease or insect damage was observed on any of the mature trees. One planted white pine had several lesions in the bark exuding pitch. One of the slow-growing, back-crossed hybrid pines had several pitch masses-caused larval *Dioryctria* attacks on the lower half of the bole. No other insect or disease problems were observed. Also observed were several young, vigorous hardwoods and a few planted exotic conifers.

The site is very sandy which suggests that annosus root rot could become a problem if trees are removed without treatment to prevent the fungus from entering the stand through the freshly cut stumps. We carefully observed the stumps of 6 trees (75 + years old) that had been cut down only a few days before we arrived. In each case the stumps appeared to be healthy with no sign of any disease or insect problems. One older stump which we observed had fruiting of the fungus *Phlebia gigantea* (Fr.) Donk, a natural competitor (and inhibitor) of the fungus which causes annosus root rot.

Sapsucker feeding holes were noticed on one of the old loblolly pines. Some sap was draining down the tree trunk. The small amount of feeding damage observed was not serious but might attract SPB or other bark beetles.

## BIOLOGY

### Southern Pine Beetle

Adult southern pine beetles are roughly 1/8 inch long, which is about the size of a grain of rice, and reddish-brown to solid black. The insect goes through four life stages - egg, larva, pupa, and adult - in the inner bark of the host pine.

Adult beetles bore through the bark of a tree and lay pearly white eggs in the inner bark. The larvae, or "grubs", are white, legless, and crescent-shaped, with glossy reddish-brown heads. The grubs mine for a short distance before boring into the outer bark where they pupate. The pupae are white and resemble the shape of the adult beetle. There are from three to seven generations per year depending on locality and weather. After killing the tree in which they develop, beetles emerge and fly to living pines to lay eggs and restart the life cycle.

Southern pine beetles may attack trees by themselves, or in combination with black turpentine beetles or any of three species of Ips engraver

beetles. The different species sometimes attack at the same time, making it hard to tell precisely what role each species plays in killing the pine and how much they help or hinder each other. Different bark beetle species attack different portions of the tree, however, their life cycles are very similar.

All of the bark beetles, either individually or in combination, kill the tree by feeding on the cambium and inner bark, thus girdling the tree. This girdling of the pine cuts off the normal flow of moisture and nutrients throughout the tree's system, causing rapid decline and death. Blue-stain fungi introduced into the tree by the feeding adult southern pine beetle also helps bring on tree death.

### Annosus Root Rot

Annosus root rot is a major problem in the management of southern pines. It is normally seen after thinning pine plantations. However, where the disease hazard is high and where individual trees have great esthetic or sentimental value, this disease must be considered. Sites with deep, well drained, sandy or sandy loam soil (at least 12" of sandy soil to the first significant inclusion of clay) have high risk for infection of trees by the annosus root rot fungus. The Stennis site fits this description. The fungus *H. annosum* invades the stand through freshly cut stumps. Spores from the fruiting bodies of this fungus land on freshly cut stumps, germinate, and grow down through the stump and into the root system. Where the cut stump's roots contact or graft with roots of a living tree, the fungus grows into the adjacent tree and causes disease manifested as a white, stringy rot of the tree's root system. This rot does two things; it reduces the water and nutrient uptake by the tree, causing a general decline of the tree, and it rots the roots to such an extent that the affected tree can be blown down, or falls over, when there is no longer any underground support. In addition, trees weakened by this disease are prime targets for bark beetle attack.

Borax treatment of freshly cut stumps is the best preventative measure to exclude the causal fungus of annosus root rot from stands where the disease is not yet present.

### RESULTS

The best way to protect pine trees is to prevent insect and disease attack. Keep them healthy. A severely stressed or lightning-struck pine is a standing invitation to southern pine beetles. The beetle's preference for sick or weak trees does not preclude them from killing healthy pines. They often do! Once the beetles have built up a large population, not even the strongest and healthiest pines can resist attack. This is why a single damaged or unhealthy pine in a neighborhood that beetles can use as a place to breed, endangers all the rest, sick or healthy.

Sapsucker feeding damage can cause serious problems for pine trees. Sometimes large patches of bark, a foot or more square, are removed by the sapsuckers. At other times the trees are girdled by the sapsucker feeding. In these cases sapsucker control measures must be taken. However, the small amount of sapsucker feeding observed on Senator Stennis' trees did not warrant any control measures. The sap flow had already stopped and begun to harden. The feeding holes will heal with the new spring growth.

The following is a list of alternatives for treatment of the pines immediately adjacent to Senator Stennis' backyard.

1. NO ACTION - This alternative allows nature to run its course. It would be the cheapest financially. The trees would be allowed to remain as they are, and natural mortality and degradation would gradually remove the mature trees. This alternative has the greatest risk of subsequent bark beetle attack, since the SPB hazard would remain high.
2. CLEARCUT AND REPLANT - The entire area would be harvested and replanted. This alternative would cause the most disturbance to the site. However, there would be an immediate realization of financial income. There would be some expense for replanting. This alternative would reduce the SPB hazard to zero. Esthetically, the immediate view may be disturbing, however, in three to five years the new growth would cover all of the disturbance.
3. SELECTIVE TREE REMOVAL - This alternative requires that a forester mark the trees that should be removed from the stand. This would reduce the basal area of the stand and release the younger pines and hardwoods that are already established in the stand. Some expense would be incurred but there would be some income from the sale of the timber removed. There would be considerable stand disturbance; however, it would be less than if the stand were clearcut. This alternative would reduce the risk of bark beetle attack in the stand. There would also be a stand of young, vigorous trees (hardwoods and pines) left on the site after this alternative were completed. Annosus root rot control would be necessary.
4. SCHEDULED INSECTICIDE TREATMENT - This alternative is very expensive. Treatment would be done at least once a year in the spring. If bark beetles became epidemic in the area, the treatment might have to be administered more often. To be effective, the trunk of each tree would have to be saturated at least to the base of the crown. This would require a high pressure hydraulic sprayer and professional personnel. Special care must be taken when pesticides are used (Appendix I).

5. WATER AND FERTILIZE - This alternative requires specialized equipment and professional personnel. It would be a very expensive alternative to undertake. It may help prolong the life of the mature loblolly and shortleaf pines. However, the trees did not appear to be suffering from nutrient and water deficiency and this would not affect the SPB hazard rating of the stand. If this alternative were undertaken, the pines should be watered during dry spells and fertilized as needed. As a general rule, two pounds of fertilizer - such as 10-8-6 formula - for each inch of tree diameter will be enough supplemental nutrition.
6. SCHEDULED SURVEILLANCE - Careful inspection of the pine trees on a regular schedule would reveal the presence of bark beetles during the early stages of an attack. Early detection is essential if losses are to be held to a minimum. A well-trained groundskeeper could make regular observations and report his findings to the Mississippi Forestry Commission for additional information and recommendations. Although this alternative would not prevent bark beetle attacks, it would be inexpensive and effective if the schedule were faithfully and carefully maintained. If a tree was observed to have bark beetle attacks, immediate removal of the infested tree and insecticide treatment of the surrounding trees should prevent the loss of additional trees. The stump would need to be treated with borax at the time of cutting to prevent annosus root rot from invading the stand.

#### DISCUSSION

The pines on the Stennis' homesite are mature loblolly and shortleaf ranging in age from 75 to 85 years. The age, site, and basal area of the stand places them in a high hazard southern pine beetle classification. Hazard classifications have not been established for Ips and black turpentine beetle, however, these beetles, especially Ips, are often closely associated with southern pine beetle. The site is also high hazard for annosus root rot.

The first priority at the Stennis homesite is to prevent any tree mortality caused by bark beetles, especially southern pine beetle, or, if the trees are attacked, minimize losses. Forest Pest Management feels that alternative 6 would best meet the management objectives of Senator Stennis.

For additional information about southern pine beetle and your ornamental pines, please refer to "Southern Pine Beetle Can Kill Your Ornamental Pine", United States Department of Agriculture, Home and Garden Bulletin, No. 226, 1978 (enclosed). If any further questions arise, please contact the Mississippi Forestry Commission in Jackson, MS (601/359-1386) or Forest Pest Management in Pineville, LA (Telephone: 318/473-7280 Commercial or 497-7280 FTS).

## APPENDIX I

### PRECAUTIONARY STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in their original containers under lock and key out of reach of children and animals, and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear appropriate protective clothing.

If your hands become contaminated with a pesticide, wash them immediately with soap and water. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove the clothing immediately and wash skin thoroughly. After handling or spraying pesticides, do not eat or drink until you have washed with soap and water.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicide from equipment, do not use the same equipment for insecticides or fungicides that you used for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your county agent, state extension specialist or FPM to be sure it is still registered for the intended use. For further information or assistance, contact the Mississippi Forestry Commission in Jackson, MS (601/359-1386) or Forest Pest Management, Alexandria Field Office, Pineville, La., 71360 (Telephone: FTS 497-7280, or Commercial 318/473-7280).


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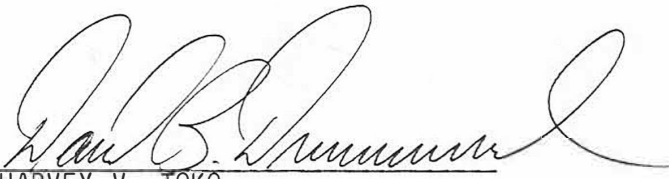
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